

ABH-200-E

External-probe fridge monitor · Probe through the seal

ABH-200 family — Online monitors & gateways · Data logger datasheet

Fridge monitor with a cabled SHT45 T+RH probe on 1.5 m PUR cable — the door stays sealed, the sensor sits where the product sits.

4 channels	IP54 in use / IP65 capped	E-paper	409,600 readings	Battery: Always on when powered (calc.)
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Specifications

Product type	Online · Wi-Fi monitor
Sensing channels	4 — Probe T + RH · Ambient T + RH
Probe T + RH	PRB-SHT45 · ± 0.1 °C typ · ± 1.0 %RH · head $-40\dots+85$ °C · 1.5 m PUR
Ambient T + RH	SHT41 on-board (monitor body)
Measurement accuracy	± 0.15 °C at 0 °C · PT100 Class A (IEC 60751) probe
Display & indication	1.54" e-paper 200 × 200 · $-25\dots+50$ °C · holds last reading while asleep
Connectivity	Wi-Fi 2.4 GHz (ESP32-C3-MINI-1U) · MQTT over TLS 1.2+ — Internal FPC · ≤ 2.33 dBi
Power	USB 5 V · CR2032 RTC ≈ 10 yr
Battery life	Always on when powered · RTC cell ≈ 10 yr — Exp-F port card carries the probe
Memory	16 MB W25Q128JV · 409,600 readings · separate never-erased audit region
Sample interval	1 s minimum · configurable
Enclosure	88.2 × 69.9 × 23.8 mm · Healthcare-grade disinfectant-resistant PC/ABS · UL94 V-0 · white
Ingress protection	IP54 in use / IP65 capped (design targets) · probe IP65 at head
Mounting	Keyhole (2×) + bonded 10×2 mm magnets
Operating band	-25 to $+50$ °C (monitor) · probe head $-40\dots+85$ °C
Firmware & transport	Signed .abhfw packages · dual-bank A/B · RSA-2048 · trial boot with automatic rollback · MQTT over TLS 1.2+ with per-device credentials (mTLS supported) · X.509 identity
Factory identity	ABH-[model]-[YYWW]-[5-digit sequence] — factory identity written to the ID EEPROM
Ports	USB-C power · JST-GH probe port (Exp-F)

Applications

Vaccine & pharma fridges (2–8 °C)	Always-on USB monitor with e-paper, alarm LED and PT100 probe — the WHO-PQS-style vaccine-fridge use case.
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Compatible probes

PRB-SHT45-1M5 — Cabled T+RH probe	PRB-SHT45-1M5 · Sensirion SHT45 · ± 0.1 °C typ · ± 1.0 %RH · -40 to +85 °C (2–8 °C fridge duty; not for ULT/dry ice)
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Part of the Abhilekh platform

One 80 × 50 mm 4-layer platform PCB — 145 parts, single-sided SMT — becomes 20 SKUs by BOM selection and a SKU record in the on-board ID EEPROM.

Firmware updates	Signed .abhfw packages · dual-bank A/B · RSA-2048 · trial boot with automatic rollback
Data transport	MQTT over TLS 1.2+ with per-device credentials (mTLS supported) · X.509 identity
Offline evidence	Plug an offline logger into a PC and it enumerates a FAT16 drive with README.TXT, DATA.CSV and an ECDSA P-256-signed REPORT.PDF — a self-verifying trip record.
Calibration	Probe channel templates live in the ID EEPROM; the platform tracks NIST-traceable calibration certificates, due dates and reminders per probe.
Certification roadmap	EN 12830:2018 — temperature recorders · CE — RED / EMC / safety · FCC Part 15 · WHO PQS E006 — vaccine cold chain · IEC 61010-1 / IEC 62368-1 · UN 38.3 / IEC 62133-2 — cells & packs — targets, not held certificates

The ABH line is at the design-frozen, pre-production stage: every enclosure has passed generated fit-check geometry (791/791 checks, 20/20 SKUs) and every battery-life, drop, thermal and IP figure shown is a calculated or simulated design estimate — measured values replace them as validation hardware runs. Regulatory marks above are the certification roadmap, not held certificates.

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